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Education, Gender, and the Workforce: The Labor Market Experiences of the 1994/95 Entering Class of the University of Maine

Maine Department of Labor

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Education, Gender, and the Workforce

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Education, Gender, and the Workforce

The Labor Market Experiences of the 1994/95 Entering Class of the University of Maine

An Interim Report

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Preface

The Maine economy is in the midst of significant structural change. Some industries are declining and shedding jobs while other industries are emerging and adding new jobs. Across the spectrum of Maine workplaces, more is being demanded of workers as the combined forces of technology, management innovation, and global competition escalate the knowledge, skills, and abilities required for job performance. An understanding of the dynamics of our economy and labor markets is fundamental to making effective public policy and developing sound investment strategies.

The Maine Department of Labor has initiated a research program to study the effects of the changing economy and its impact on Maine's workforce. In an effort to obtain a more complete picture of how the workforce is adapting to the changing Maine economy, several cohorts of individuals have been identified for more in-depth study. These same cohorts can be revisited in the future, allowing identification of impacts on employment and earnings over time. Combining the results from the studies of various cohorts will assist policymakers, workforce planners, education and training experts, employers, and workers better understand Maine's changing economy and the implications for workforce development.

Without doubt, investments in education and training typically lead to both individual and social gain. A better educated citizen makes our society better. But, as resources become more limited, policymakers must become focused on the scale of returns that different types of investment generate. Investments in skills development may be evaluated by examination of the employment and earnings experiences of individuals applying these skills.

This study examines the experiences of a group of University of Maine students and their employment status after attending the University. It uses a combination of administrative data from the Maine Department of Labor and the University of Maine. These two data sources provided considerable detail about the demographic characteristics, work histories, and university experiences of these individuals. The analysis provided in this report is intended to help workforce planners, economic development officials, education administrators, and community leaders formulate more effective strategies and programs for improving the employment outcomes of post-secondary graduates in the twenty-first century economy.

Questions and comments regarding this report should be directed to Betty Dawson, Workforce Performance and Evaluation Manager, or Amanda Rector or John Roberts, Economic Research Analysts, Maine Department of Labor, P.O. Box 259, Augusta, Maine, 04332-0259, Telephone (207) 287-2271, TTY 1-800-794-1110.

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Introduction

This study examined the effects of post-secondary education on workers' earnings and employment. In late 2004 the Labor Market Information Services (LMIS) division of the Maine Department of Labor (MDOL) and the Margaret Chase Smith Policy Center of the University of Maine initiated a project that followed a group of students of the University of Maine (UMaine) and examined their employment status after attending the university. The three primary objectives of this project were:

- to understand what happens to students who enter UMaine;
    - the extent to which UMaine prepares students for participation in the workforce
    - whether students come to UMaine for an education and then leave Maine

- to understand the impact of gender on labor market outcomes: how women fare in employment compared to men;
    - whether postsecondary education acts as an equalizer
    - within gender, how degree attainment relates to earnings

- to create a cohort whose progress through the workforce can be tracked to facilitate better understanding of Maine's economy and how the university system contributes to it.

Wage records provide one of the most effective means for tracking employment and earnings of most workers. These records are earnings reported by employers for each quarter of the year. They also indicate employment tenure and industry affiliation. Monitoring of wage records over time permits the analysis of employment and earnings dynamics. Increasingly, more use is being made of these records, especially when they are linked with student information or other administrative data describing additional characteristics of the individual.

Since wage records are limited to covered employment within the state of Maine, they do not include earnings for employment outside the state of Maine, self-employment, and employment with the United States government or military. Therefore, if individuals have earnings from both covered and non-covered employment, their wage record earnings would be lower than their actual total earnings.

Despite these limitations of the wage records, they do, however, provide insight into the employment choices of the majority of cohort members. The initial findings presented in this interim study call for further analyses of employment patterns in the Maine economy. The roles played by part-time employment, seasonal employment, and multiple job-holding must be identified in order to determine the impact of each in the Maine labor market. Because of the potential insights which may be gained through additional research, this is an interim report and will be followed by further studies.

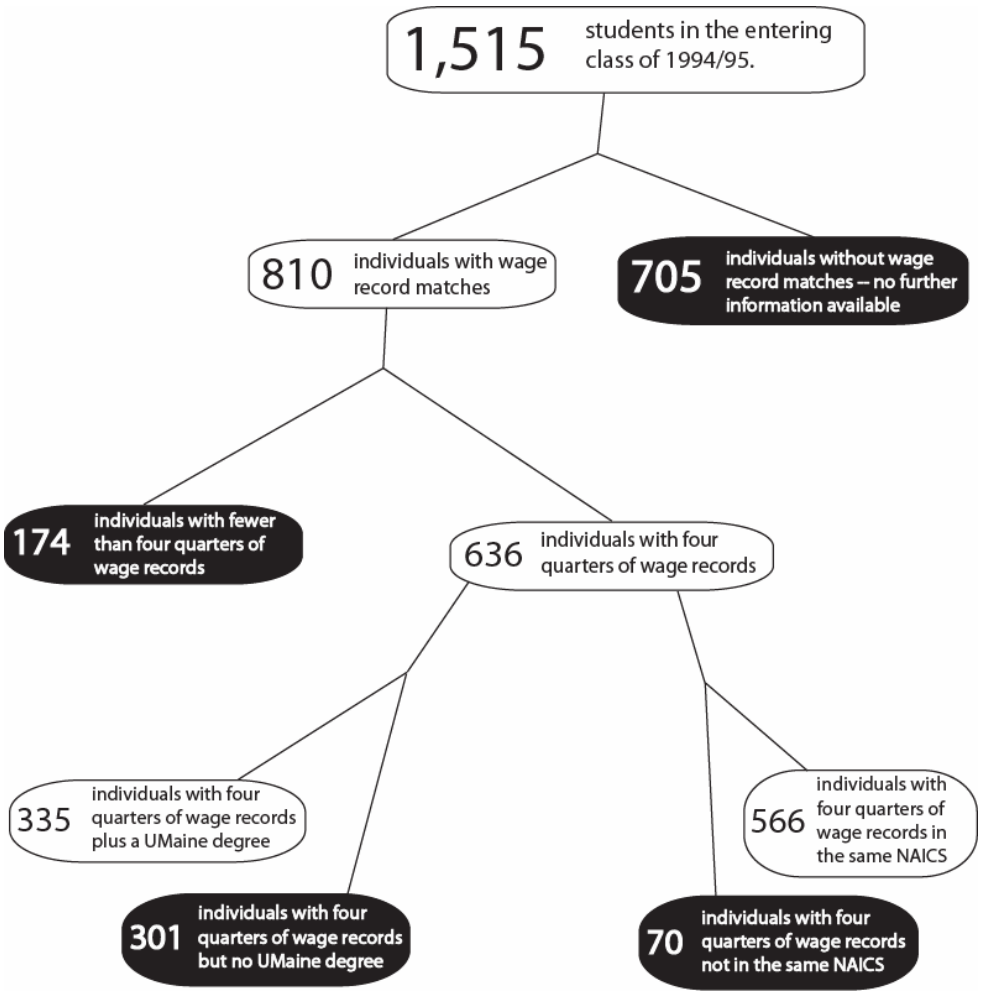
Methodology

By combining the wage records for 2003 and student information for the entering class of 1994/95 it was possible to analyze the individuals in this study by many different characteristics. Student data from the university provided characteristics of the individuals before they entered UMaine and characteristics of their performance at the University. The student information was matched to wage records to obtain the characteristics of employment in the year analyzed.

This data matching was accomplished through an extensive process. Following the signing of mutual confidentiality and data sharing agreements, UMaine sent LMIS a list of the individuals within the selected class. LMIS initially matched the individuals to a single quarter of wage records and returned the wage record data to UMaine. UMaine then matched the wage records to their own student records to provide demographics and student data, assigned random identifiers to the records and stripped them of any identifying information, and sent the combined data files back to LMIS. Upon review, it was determined that the files lacked certain data elements. The file structure was revised accordingly and the overall data matching process was repeated with a full year of wage records.

Analysts at LMIS used the combined data file to create a database from which queries could be built to address the research questions initially identified in the discussion between the MDOL and the Margaret Chase Smith Policy Center.

The diagram to the right illustrates the breakdown of the study group as used in this analysis. The overall group of 1,515 individuals was separated into those with wage record matches and those without. The individuals with wage records were then further divided into those with four quarters of wage records and those with fewer than four quarters of wage records. Two additional breakouts were performed on the individuals with four quarters of wage records. The first divided them according to whether or not they had received a degree from UMaine. The second grouped them according to whether or not they worked all four quarters in the same industrial sector.



The UMaine Entering Class of 1994: A Descriptive Analysis

Characteristics of All Students Entering in 1994/95

The first step of the project identified the characteristics of the 1,515 students in this study. The personal characteristics of gender, age group at the time of entry into the university, and high school location were examined. (See Table 1.)

Slightly more than half of the students were male. Around 89 percent were under 21 years of age, which is traditional for a university entering class. A little over three-fourths of the students graduated from a Maine high school.

Table 1

Personal Characteristics of All Students

	Number	Percent
Gender		
Female	733	48.4
Male	782	51.6
Age Group at Time of Enrollment		
Under 21	1,347	88.9
21 to 28	103	6.8
29 to 39	55	3.6
40 and Over	10	0.7
High School Location		
General Equivalency Diploma (GED)	29	1.9
High School in Other State	305	20.1
Maine High School	1,141	75.3
Unknown/Other[1]	40	2.7
Total	**1,515**	**100.0**

[1]Unknown/Other includes international students, home-schooled students, and those for whom no high school information was available.

Table 2

University Characteristics of All Students

	Number	Percent
Field of Study		
Business & Administration	150	9.9
Education	170	11.2
Engineering	180	11.9
Liberal Arts	494	32.6
Natural Resources, Veterinary & Food Science	157	10.4
Nursing & Health	78	5.1
Science & Math	70	4.6
No Field of Study Listed	216	14.3
Highest Degree Earned at UMaine		
Associate	40	2.6
Bachelor's	667	44.0
Certificate	6	0.4
Master's	57	3.8
No Degree Earned	745	49.2
Undergraduate GPA		
Greater than or equal to 2.67	718	47.4
Less than 2.67	743	49.0
No GPA	54	3.6
Total	**1,515**	**100.0**

The next step looked at the university characteristics of field of study, highest degree earned, and undergraduate Grade Point Average (GPA) for these students. (See Table 2.) The field of study characteristic, as determined by UMaine, comprises a combination of major and college of enrollment.

Approximately one-third of the students chose liberal arts as their field of study. Forty-four percent of the students received a Bachelor's degree. There was a fairly equal division between students with a GPA of 2.67 or greater and those with a GPA less than 2.67. The GPA of 2.67, equivalent to a B- letter grade, was selected somewhat arbitrarily as the distinction between greater and lesser academic performance.

Over 75 percent of the students who earned a degree at UMaine had a GPA greater than or equal to 2.67. Similarly, almost 75 percent of the students who did not earn a degree from UMaine had a GPA less than 2.67. (See Table 3.) Any student without a GPA would have been ineligible to earn a degree from UMaine. Some of those not earning a degree from UMaine might have transferred to another university.

Table 3

Achievement of Degree by Undergraduate GPA for All Students

Earned Degree at UMaine	Number with GPA < 2.67	Percent of Row	Number with GPA >= 2.67	Percent of Row	Number with No GPA	Percent of Row	Total
Yes	190	24.7	578	75.3	0	0.0	**768**
No	553	74.1	140	18.7	54	7.2	**747**
Total	**743**	**49.0**	**718**	**47.4**	**54**	**3.6**	**1,515**

Characteristics of Individuals with Wages in 2003

In the 1,515 records provided by UMaine, 810 individuals had matching wage records in Maine during 2003 while 705 individuals lacked matching wage records. Of these 810 individuals, 636 had four quarters of wage data, while 174 had one, two, or three quarters of wage data. The 705 individuals without wages may have been self-employed, working out of state, federal government employees, unemployed, or out of the labor force. No further employment information is currently available for these individuals although future research efforts will be able to capture these important data.

Though men outnumbered women in this entering class, more women than men had covered wages in Maine during this time period. Over one-third of individuals without covered wages entered UMaine from a high school outside of Maine. (See Table 4.)

Table 4

Personal Characteristics of Individuals with Any Wages and Individuals without Wages

	Individuals with Any Wages		Individuals without Wages	
	Number	**Percent**	**Number**	**Percent**
Gender				
Female	415	51.2	318	45.1
Male	395	48.8	387	54.9
Age Group at Time of Enrollment				
Under 21	702	86.7	645	91.5
21 to 28	62	7.7	41	5.8
29 to 39	42	5.2	13	1.8
40 and Over	4	0.4	6	0.9
Age Group in 2003				
21 to 28	665	82.1	615	87.2
29 to 39	113	14.0	74	10.5
40 and Over	32	3.9	16	2.3
High School Location				
General Equivalency Diploma	20	2.5	9	1.3
High School in Other State	50	6.2	255	36.2
Maine High School	732	90.3	409	58.0
Unknown/Other[1]	8	1.0	32	4.5
Total	**810**	**100.0**	**705**	**100.0**

[1]Unknown/Other includes international students, home-schooled students, and those for whom no high school information was available.

The remainder of this paper compares and analyzes the employment outcomes of three groups of individuals with wages: individuals with any wages, individuals with four quarters of wages, and individuals with wages in fewer than four quarters. The most noticeable difference in the personal characteristics of these three groups was in the category of high school location. A larger percentage of the individuals with four quarters of wages graduated from a Maine high school than did the individuals with wages in fewer than four quarters. (See Table 5.)

Table 5

Personal Characteristics of Individuals with Wages

	Individuals with Any Wages		Individuals with Four Quarters of Wages		Individuals with Fewer Than Four Quarters of Wages	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Gender						
Female	415	51.2	328	51.6	87	50.0
Male	395	48.8	308	48.4	87	50.0
Age Group at Time of Enrollment						
Under 21	702	86.7	556	87.4	146	83.9
21 to 28	62	7.7	47	7.4	15	8.6
29 to 39	42	5.2	29	4.6	13	7.5
40 and Over	4	0.4	4	0.6	0	0.0
Age Group at Time of Employment						
21 to 28	665	82.1	527	82.9	138	79.3
29 to 39	113	14.0	84	13.2	29	16.7
40 and Over	32	3.9	25	3.9	7	4.0
High School Location						
General Equivalency Diploma	20	2.5	10	1.6	10	5.7
High School in Other State	50	6.2	33	5.2	17	9.8
Maine High School	732	90.3	585	92.0	147	84.5
Unknown/Other[1]	8	1.0	8	1.2	0	0.0
Total	**810**	**100.0**	**636**	**100.0**	**174**	**100.0**

[1]Unknown/Other includes international students, home-schooled students, and those for whom no high school information was available.

Over 90 percent of the individuals with any wages graduated from a Maine high school compared to only 75 percent of the original 1,515 students; those students employed in Maine were more likely to have come from a Maine high school. Of those students entering UMaine with a GED, over two-thirds had Maine wages. Less than one-fifth of students entering the university as high school graduates from other states or with undetermined high school locations earned Maine wages.

As expected, the university characteristics of all three groups of individuals with wages are very similar to those of all students. (See Table 6.)

Table 6

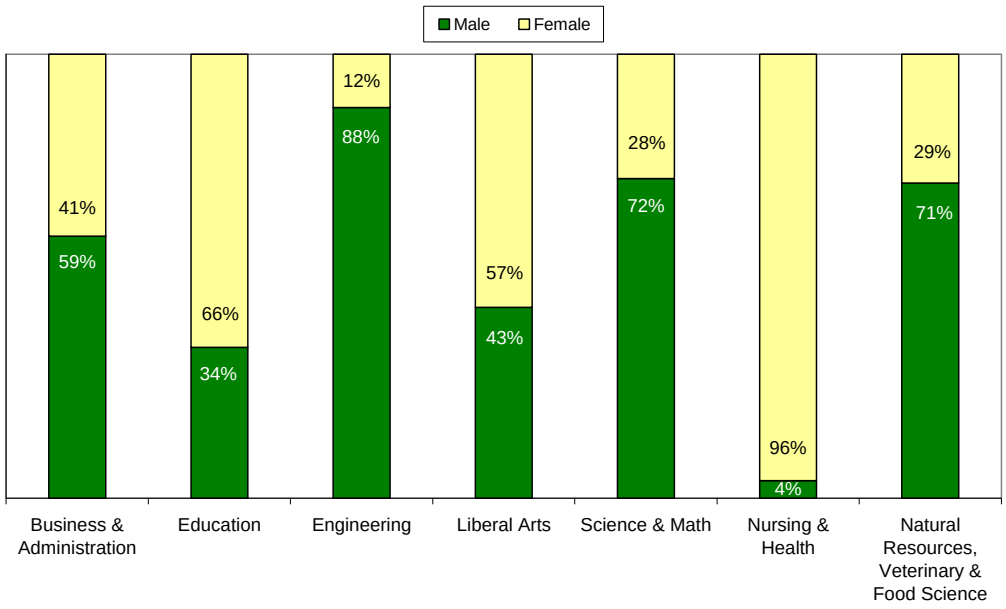
University Characteristics of Individuals with Wages

	Individuals with Any Wages		Individuals with Four Quarters of Wages		Individuals with Wages in Fewer Than Four Quarters	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Field of Study						
Business & Administration	87	10.8	70	11.0	17	9.8
Education	107	13.2	82	12.9	25	14.4
Engineering	93	11.5	78	12.3	15	8.6
Liberal Arts	265	32.7	208	32.7	57	32.8
Natural Resources, Veterinary, & Food Science	61	7.5	47	7.4	14	8.0
Nursing & Health	57	7.0	50	7.9	7	4.0
Science & Math	25	3.1	20	3.1	5	2.9
No Field of Study Listed	115	14.2	81	12.7	34	19.5
Highest Degree Earned at UMaine						
Associate	30	3.7	25	3.9	5	2.9
Bachelor's	341	42.1	276	43.4	65	37.4
Certificate	3	0.4	3	0.5	0	0.0
Master's	41	5.0	34	5.3	7	4.0
No Degree Earned	395	48.8	298	46.9	97	55.7
Undergraduate GPA						
Greater than or equal to 2.67	392	48.4	321	50.5	71	40.8
Less than 2.67	386	47.7	292	45.9	94	54.0
No GPA	32	3.9	23	3.6	9	5.2
Total	**810**	**100.0**	**636**	**100.0**	**174**	**100.0**

There was a significant difference between the genders in the choice of field of study. (See Chart A. Corresponding Table I located in the Appendix.) The fields in which more women than men studied were education, liberal arts, and nursing and health. The fields in which more men than women studied were business and administration; science and math; engineering; and natural resources, veterinary, and food science. It is important to note that these are fields of study and individuals might not be employed in the same field as the one in which they studied.

Chart A

Percent Distribution of Gender by Field of Study for Individuals with Any Wages



The distribution of GPAs and achievement of degree for the individuals with wages was very similar to that for all individuals in the study. (See Table 7.) The largest difference occurred for those individuals with wages in fewer than four quarters who earned a degree from UMaine. A greater percent of these individuals had a GPA less than 2.67.

Table 7

Achievement of Degree by Undergraduate GPA for Individuals with Wages

Earned Degree at UMaine	GPA < 2.67		GPA >= 2.67		No GPA		Total
	Number	Percent of Row	Number	Percent of Row	Number	Percent of Row	
Individuals with Any Wages							
Yes	91	21.9	324	78.1	0	0.0	**415**
No	295	74.7	68	17.2	32	8.1	**395**
Total	**386**	**47.6**	**392**	**48.4**	**32**	**4.0**	**810**
Individuals with Four Quarters of Wages							
Yes	67	19.8	271	80.2	0	0.0	**338**
No	225	75.5	50	16.8	23	7.7	**298**
Total	**292**	**45.9**	**321**	**50.5**	**23**	**3.6**	**636**
Individuals with Wages in Fewer Than Four Quarters							
Yes	24	31.2	53	68.8	0	0.0	**77**
No	70	72.2	18	18.5	9	9.3	**97**
Total	**94**	**54.0**	**71**	**40.8**	**9**	**5.2**	**174**

The UMaine Entering Class of 1994: Labor Market Experience in 2003

Wage records provide important information on employment and earnings of workers. However, due to the nature of wage records, individuals could have wages from both covered employment and non-covered employment. In such instances, their wages would appear lower than they really are. For example, an individual might show total wages of $4,000 in a quarter using the data from the wage records but have an additional $3,000 of wages that quarter from self-employment. This individual's true quarterly earnings would be $7,000 but, from the wage records data, the quarterly earnings would appear to be only $4,000.

The initial analysis of the combined data from the MDOL wage records and the individual characteristics from UMaine indicates some clear differences between male and female workers. Of the individuals with wage records, 415 workers were female and 395 were male. Both the average quarterly wage and average annual wage were significantly higher for male workers than female workers. To provide a basis for comparison, earnings are included for the Maine workforce, ages 22 to 34. (See Table 8 and Chart B.)

Table 8

Average Quarterly and Annual Wages by Gender for Individuals with Wages

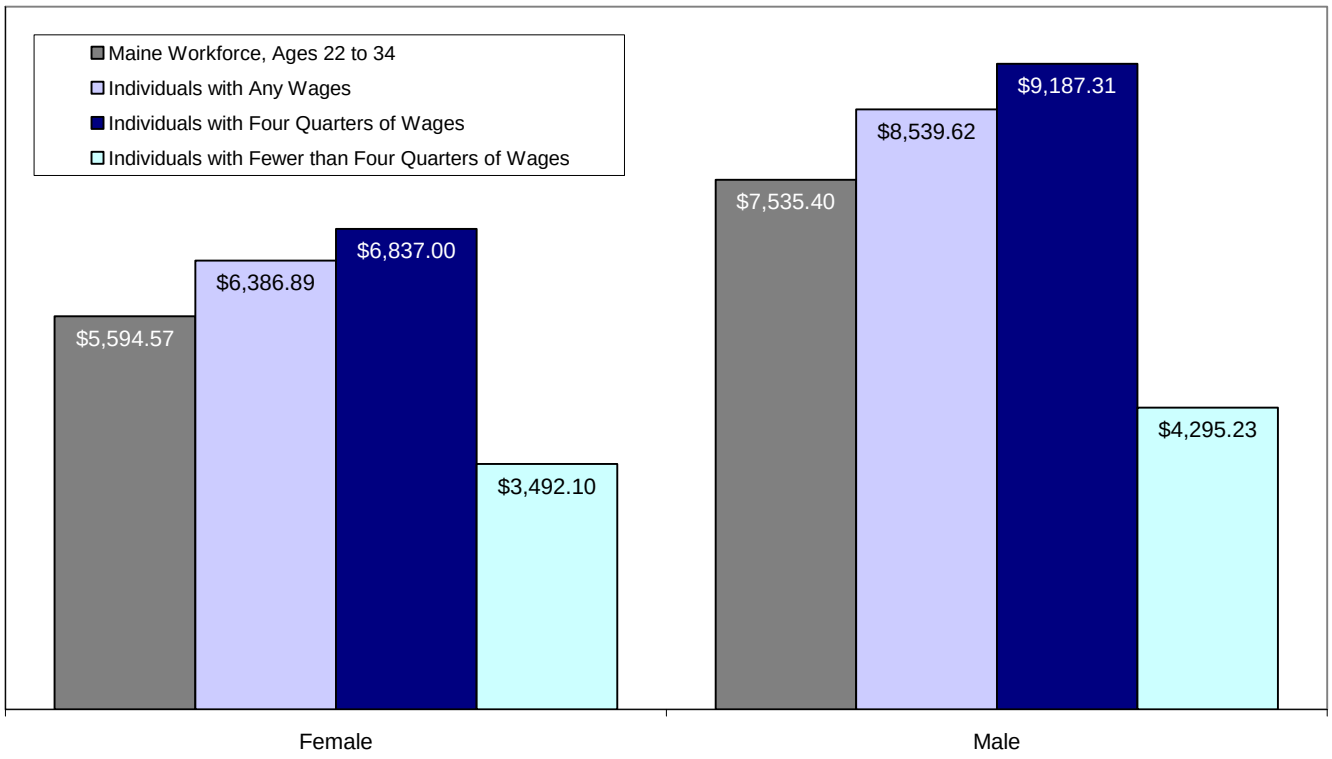
	Number	Percent	Average Quarterly Wage ($)	Average Annual Wage ($)
Maine Workforce, Ages 22 to 34				
Female	72,787	50.2	5,594.57	22,378.29
Male	72,140	49.8	7,535.40	30,141.61
Total	**144,928**	**100.0**	**6,553.81**	**26,215.24**
Individuals with Any Wages				
Female	415	51.2	6,386.89	25,547.56
Male	395	48.8	8,539.62	34,158.48
Total	**810**	**100.0**	**7,428.06**	**29,712.24**
Individuals with Four Quarters of Wages				
Female	328	51.6	6,837.00	27,348.00
Male	308	48.4	9,187.31	36,749.24
Total	**636**	**100.0**	**7,975.20**	**31,900.80**
Individuals with Fewer than Four Quarters of Wages				
Female	87	50.0	3,492.10	*
Male	87	50.0	4,295.23	*
Total	**174**	**100.0**	**3,877.27**	*****

*Average annual wages were not calculated for individuals with fewer than four quarters of wages.

Source: Maine Workforce data from the U.S. Census Bureau, Local Employment Dynamics (LED).

Chart B

Average Quarterly Wages by Gender



Source: Maine Workforce data from the U.S. Census Bureau, Local Employment Dynamics (LED).

Overall, the average quarterly wage for individuals with wages in all four quarters exceeded the average quarterly wage for the Maine workforce ages 22 to 34. The average quarterly wage for individuals with wages in fewer than four quarters was lower than that for the Maine workforce ages 22 to 34.

The earnings gap between men and women increased as individuals were employed in all four quarters. The ratio of female to male earnings among individuals with four quarters of wages was 0.74. On average, for every dollar that a male worker earned, a female worker earned 74 cents. The ratio was 0.81 among the individuals with wages in fewer than four quarters. The ratio for the Maine workforce ages 22 to 34 was also 0.74. (See Table 9.)

Table 9
Ratios of Female to Male Earnings for Individuals with Wages

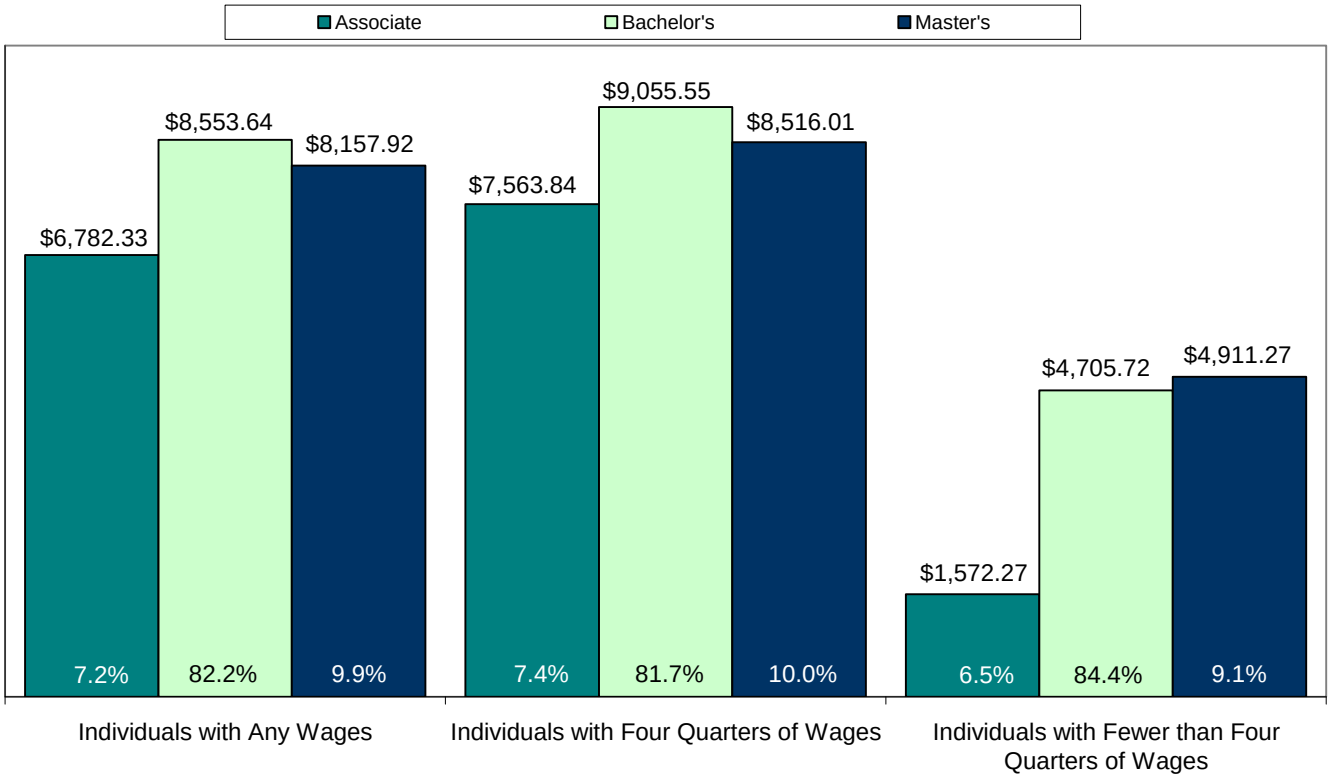
Employment Category	Ratio
Maine Workforce, Ages 22 to 34	0.74
Individuals with Any Wages	0.75
Individuals with Four Quarters of Wages	0.74
Individuals with Fewer with Four Quarters of Wages	0.81

This gap in earnings between female and male workers persists throughout all preliminary tables. It is entirely possible that some of this earnings gap was due to variations in the number of hours worked by men and women. For example, if women are more likely to work part-time, whereas men are more likely to work full-time, women would show lower average quarterly wages than men. Unfortunately, the wage records do not contain data on hourly rates or part-time versus full-time workers. Wages are only reported on a quarterly basis for wage records, with no indication of the number of hours worked.

Of the 810 individuals with wages, 415 earned a degree from UMaine, with 338 having four quarters of wages and 77 having fewer than four quarters of wages. Only three of these individuals earned a Certificate, such a small number that any average wages calculated would have very little meaning; therefore, the average quarterly wages by degree earned are shown for only Associate, Bachelor's, and Master's degrees. (See Chart C. Corresponding Table II located in the Appendix.)

Chart C

Percent Distribution of Individuals by Average Quarterly Wages and Highest Degree Earned at UMaine



For individuals with wages in fewer than four quarters the highest average quarterly wage was for those who earned a Master's degree. However, for individuals with four quarters of wages, those who earned a Bachelor's degree had the highest average quarterly wage.

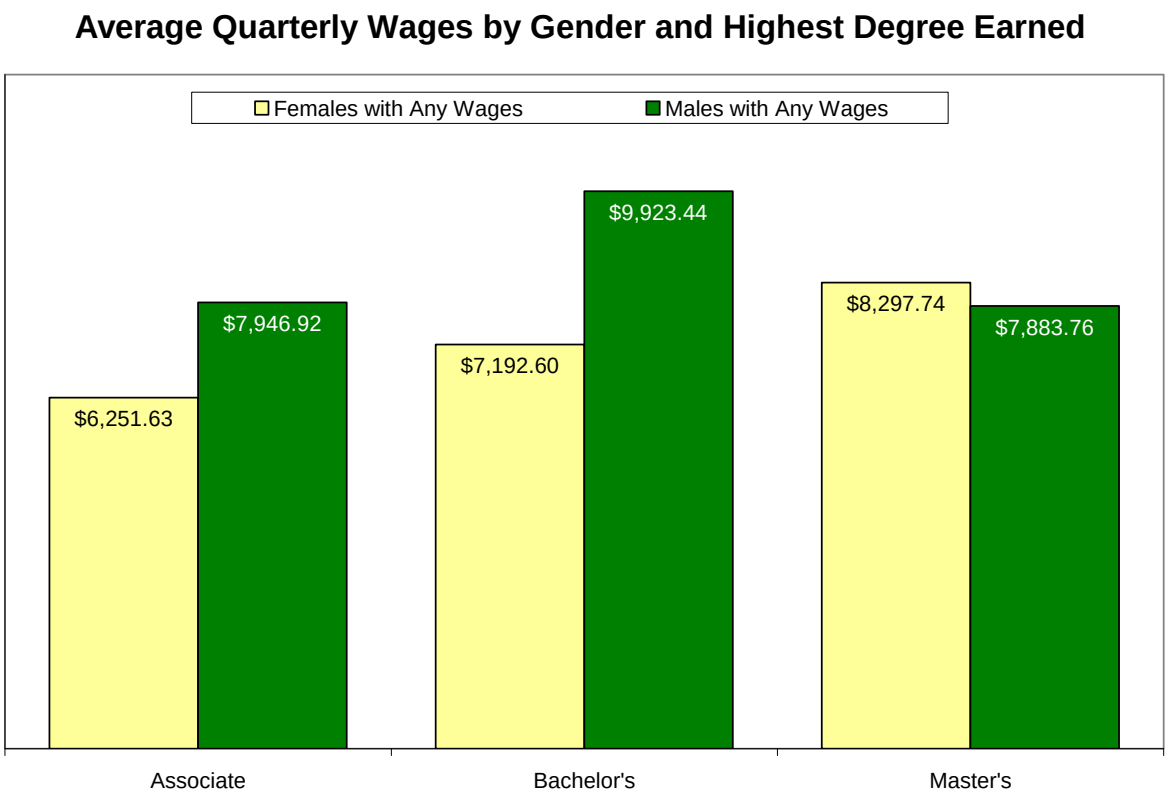
For males with any wages, those earning a Bachelor's degree had the highest average quarterly wage. (See Table 10 and Chart D.) However, for females, the highest average quarterly wage was for those earning a Master's degree. Nonetheless, the average quarterly wage for women earning a Master's degree, though more than that for men earning a Master's degree, was still less than that for men earning a Bachelor's degree.

Table 10

Average Quarterly Wages by Gender and Highest Degree Earned for Individuals with Wages

	Associate		Bachelor's		Master's	
	Number	Average Quarterly Wage ($)	Number	Average Quarterly Wage ($)	Number	Average Quarterly Wage ($)
Individuals with Any Wages						
Female	21	6,251.63	171	7,192.60	26	8,297.74
Male	9	7,946.92	170	9,923.44	15	7,883.76
Total	**30**	**6,782.33**	**341**	**8,553.64**	**41**	**8,157.92**
Individuals with Four Quarters of Wages						
Female	16	7,348.36	138	7,568.90	23	8,605.84
Male	9	7,946.92	138	10,542.19	11	8,328.18
Total	**25**	**7,563.84**	**276**	**9,055.55**	**34**	**8,516.00**
Individuals with Wages in Fewer Than Four Quarters						
Female	5	1,572.27	33	4,385.59	3	4,754.63
Male	0	0.00	32	5,044.13	4	5,090.29
Total	**5**	**1,572.27**	**65**	**4,705.72**	**7**	**4,911.27**

Chart D



Next, average quarterly wages were examined by age group. Average quarterly wages were calculated according to age at the time of employment rather than at the time of entrance into the university. Interestingly, it is the individuals in the younger age group, from 21 to 28, who have the highest average quarterly wage. (See Table 11.) Individuals age 40 and older, who would be expected to have the most work experience and thus the highest wages, actually have the lowest average quarterly wage. Further research would be required to identify precisely why this is the case.

Wages by field of study were examined next. Individuals who studied engineering had by far the highest average quarterly wage. (See Chart E. Corresponding Table III located in the Appendix.) While more individuals chose liberal arts than any other field of study, they earned one of the lowest average quarterly wages.

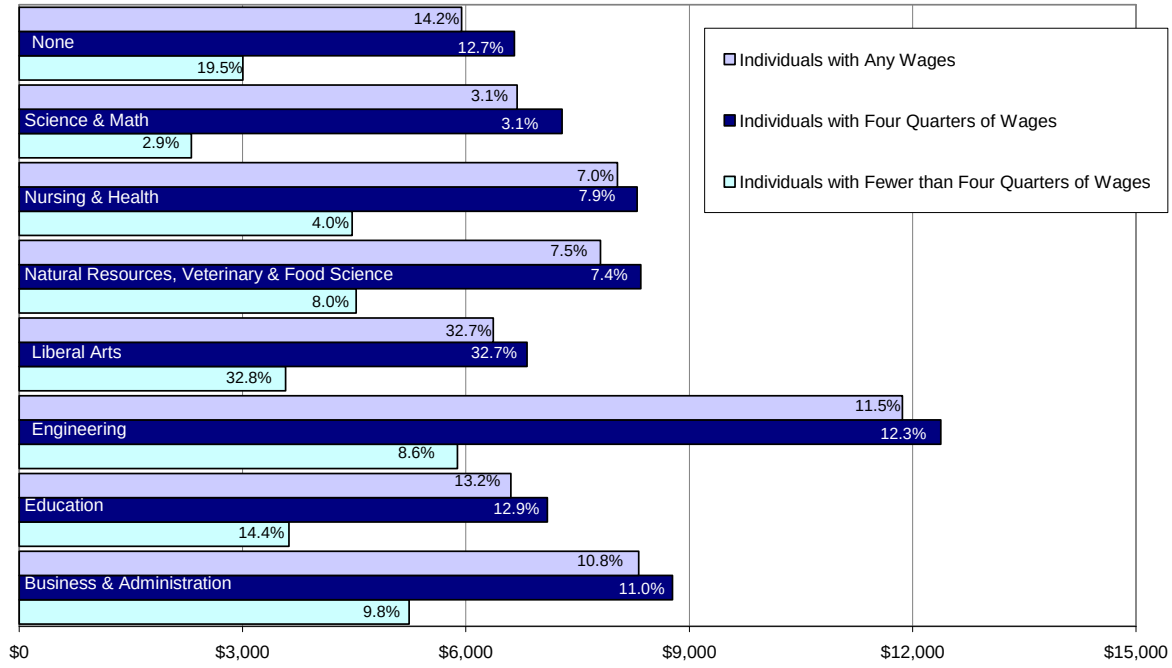
Table 11

Average Quarterly Wages by Age Group for Individuals with Wages

	Average Quarterly Wage ($)	Number	Percent
Individuals with Any Wages			
21 to 28	7,644.11	665	82.1
29 to 39	6,482.84	113	14.0
40 and Over	6,222.66	32	3.9
Total	**7,428.06**	**810**	**100.0**
Individuals with Four Quarters of Wages			
21 to 28	8,163.54	527	82.9
29 to 39	7,151.68	84	13.2
40 and Over	6,772.09	25	3.9
Total	**7,975.20**	**636**	**100.0**
Individuals with Wages in Fewer Than Four Quarters			
21 to 28	4,089.05	138	79.3
29 to 39	3,128.67	29	16.7
40 and Over	2,990.71	7	4.0
Total	**3,877.27**	**174**	**100.0**

Chart E

Percent Distribution of Individuals by Average Quarterly Wages and Field of Study



The distribution of average quarterly wages by field of study and gender is similar among all three groups of individuals with wages. (See Table 12.) While the average quarterly wage for women who studied engineering was actually higher than that for men, far more men studied engineering than women. Among those with fewer than four quarters of wages, the highest average quarterly wage for men was for those who studied business and administration; the highest average quarterly wage for women was for those who studied engineering.

Table 12

Average Quarterly Wages by Field of Study and Gender for Individuals with Wages

	Female			Male		
	Average Quarterly Wage ($)	Number	Percent	Average Quarterly Wage ($)	Number	Percent
Individuals with Any Wages						
Business & Administration	7,343.53	36	8.7	9,030.86	51	12.9
Education	6,245.32	71	17.1	7,275.61	36	9.1
Engineering	12,023.22	11	2.7	11,842.95	82	20.8
Liberal Arts	5,804.94	150	36.1	7,129.41	115	29.1
Natural Resources, Veterinary & Food Science	6,572.59	18	4.3	8,339.67	43	10.9
Nursing & Health	7,837.72	55	13.3	*	*	*
Science & Math	6,546.37	7	1.7	6,749.75	18	4.6
No Field of Study Listed	5,180.66	67	16.1	7,083.09	48	12.2
Total	**6,386.89**	**415**	**100.0**	**8,539.62**	**395**	**100.0**
Individuals with Four Quarters of Wages						
Business & Administration	7,752.02	30	9.2	9,538.10	40	13.0
Education	6,741.19	53	16.2	7,741.45	29	9.5
Engineering	12,788.13	8	2.4	12,332.56	70	22.7
Liberal Arts	6,197.04	119	36.3	7,657.56	89	28.9
Natural Resources, Veterinary & Food Science	6,753.53	15	4.6	9,095.61	32	10.4
Nursing & Health	8,100.56	48	14.6	*	*	*
Science & Math	7,176.54	6	1.8	7,340.50	14	4.5
No Field of Study Listed	5,709.19	49	14.9	8,089.37	32	10.4
Total	**6,837.00**	**328**	**100.0**	**9,187.31**	**308**	**100.0**
Individuals with Wages in Fewer Than Four Quarters						
Business & Administration	4,075.67	6	6.9	5,909.42	11	12.6
Education	3,404.11	18	20.7	4,096.94	7	8.1
Engineering	5,904.00	3	3.4	5,882.57	12	13.8
Liberal Arts	3,442.42	31	35.7	3,773.68	26	29.9
Natural Resources, Veterinary & Food Science	4,763.17	3	3.4	4,469.24	11	12.6
Nursing & Health	4,473.40	7	8.1	N/A	0	0.0
Science & Math	*	*	*	2,614.50	4	4.6
No Field of Study Listed	2,878.64	18	20.7	3,179.94	16	18.4
Total	**3,492.10**	**87**	**100.0**	**4,295.23**	**87**	**100.0**

*Data do not meet Federal or State disclosure criteria but are included in the Total row.

Average quarterly wages are consistently and significantly higher in all fields of study for those individuals who earned a degree from UMaine than for those individuals who did not. (See Table 13.)

Table 13

Average Quarterly Wages by Field of Study and Achievement of Degree for Individuals with Wages

	Earned Degree from UMaine			Did Not Earn Degree from UMaine		
	Average Quarterly Wage ($)	Number	Percent	Average Quarterly Wage ($)	Number	Percent
Individuals with Any Wages						
Business & Administration	8,783.37	48	11.6	7,738.69	39	9.9
Education	6,985.29	83	20.0	5,164.78	24	6.1
Engineering	13,441.69	67	16.1	8,032.78	26	6.6
Liberal Arts	6,518.33	135	32.5	6,210.94	130	32.9
Natural Resources, Veterinary & Food Science	8,495.29	35	8.4	6,874.76	26	6.6
Nursing & Health	8,974.85	36	8.7	6,240.03	21	5.3
Science & Math	6,966.28	11	2.7	6,472.25	14	3.5
No Field of Study Listed	N/A	0	0.0	5,942.58	115	29.1
Total	**8,367.25**	**415**	**100.0**	**6,411.61**	**395**	**100.0**
Individuals with Four Quarters of Wages						
Business & Administration	9,065.08	40	11.8	8,382.70	30	10.0
Education	7,290.43	68	20.1	6,145.43	14	4.7
Engineering	14,127.23	55	16.2	8,199.41	23	7.7
Liberal Arts	7,047.76	105	31.1	6,591.56	103	34.6
Natural Resources, Veterinary & Food Science	9,048.91	27	8.0	7,402.10	20	6.7
Nursing & Health	9,137.41	34	10.1	6,522.30	16	5.4
Science & Math	7,558.94	9	2.7	7,072.34	11	3.7
No Field of Study Listed	N/A	0	0.0	6,649.51	81	27.2
Total	**8,870.97**	**338**	**100.0**	**6,959.19**	**298**	**100.0**
Individuals with Wages in Fewer Than Four Quarters						
Business & Administration	6,411.05	8	10.4	4,225.91	9	9.3
Education	4,218.73	15	19.5	2,876.58	10	10.3
Engineering	5,900.80	12	15.6	5,842.71	3	3.1
Liberal Arts	3,667.54	30	39.0	3,459.81	27	27.8
Natural Resources, Veterinary & Food Science	5,173.61	8	10.4	3,629.62	6	6.2
Nursing & Health	*	*	*	4,433.50	5	5.2
Science & Math	*	*	*	2,700.29	3	3.1
No Field of Study Listed	N/A	0	0.0	3,006.12	34	35.0
Total	**4,453.31**	**77**	**100.0**	**3,417.50**	**97**	**100.0**

*Data do not meet Federal or State disclosure criteria but are included in the Total row.

Of the individuals in the study with wages in all four quarters, 566 had primary employment within the same North American Industry Classification System (NAICS) sector during all four quarters. (See Table 14.) The industry sector of primary employment for an individual was the NAICS sector from which the individual received the most wages in the quarter. For individuals with wages from multiple employers in a given quarter, all of those wages were assigned to the industry sector of primary employment.

Overall, the industry sector with the highest average quarterly wage was manufacturing. The average quarterly wage in the leisure and hospitality sector was lowest and less than half that earned in manufacturing. The industry sector employing the most individuals was education and health services, in which over one-third of individuals were employed.

Table 14

Average Quarterly Wages by NAICS Sector

	Average Quarterly Wage ($)	Number	Percent
Manufacturing	11,979.94	53	9.4
Natural Resources & Mining	10,327.15	5	0.9
Construction	10,167.44	17	3.0
Professional & Business Services	9,698.84	57	10.1
Financial Activities	9,208.94	57	10.1
Public Administration	9,196.88	42	7.4
Information	7,936.91	20	3.5
Trade, Transportation & Utilities	7,672.02	78	13.8
Other Services	7,525.25	11	1.9
Education & Health Services	6,963.73	206	36.4
Leisure & Hospitality	5,227.69	20	3.5
Total	**8,308.21**	**566**	**100.0**

For both women and men with four quarters of wages in the same industry sector, the highest average quarterly wage was in manufacturing. For the 292 women in this group, education and health services was the industry sector with the highest employment, with over 57 percent employed in this sector. Less than 15 percent of the 274 men were employed in this industry sector. Employment among men was more evenly distributed across industry sectors. (See Table 15.)

Table 15

Average Quarterly Wages by NAICS Sector and Gender

	Female			Male		
	Average Quarterly Wage ($)	Number	Percent	Average Quarterly Wage ($)	Number	Percent
Construction	*	*	*	10,452.62	15	5.5
Education & Health Services	6,875.81	167	57.2	7,340.24	39	14.2
Financial Activities	7,825.76	27	9.2	10,453.80	30	11.0
Information	6,932.72	8	2.7	8,606.38	12	4.4
Leisure & Hospitality	4,050.81	8	2.7	6,012.27	12	4.4
Manufacturing	10,483.93	11	3.8	12,371.76	42	15.3
Natural Resources & Mining	N/A	0	0.0	10,327.15	5	1.8
Other Services	6,083.17	6	2.1	9,255.75	5	1.8
Professional & Business Services	8,260.52	21	7.2	10,537.85	36	13.1
Public Administration	8,159.55	11	3.8	9,564.96	31	11.3
Trade, Transportation & Utilities	6,214.03	31	10.6	8,633.66	47	17.2
Total	**7,093.03**	**292**	**100.0**	**9,603.22**	**274**	**100.0**

*Data do not meet Federal or State disclosure criteria but are included in the Total row.

Summary

This study was designed with several distinct goals:

- To create a cohort whose progress through the workforce can be tracked over time;
- To follow the employment outcomes of students who had entered UMaine; and
- To understand the impact of gender on labor market outcomes: how women fare in employment compared to men.

This study is the initial step toward achieving these goals. The employment outcomes of these students were identified for a single year with the possibility of examining other years for more extensive analysis. This study did, however, reveal benchmark data against which future findings can be measured.

- The 1,515 students in the entering class of 1994/95 were divided fairly evenly by gender, with almost 90 percent under the age of 21.
    - Over three-fourths of the students had graduated from a Maine high school.
    - Just over half of the students earned a degree during their stay at the University.
    - Slightly less than one-third of the students studied in the liberal arts field, with the remainder dispersed across a variety of other fields of study.
- There were 810 individuals with Maine wages in 2003.
    - Over 90 percent of these were graduates of a Maine high school.
    - The 395 men had higher average quarterly wages than the 415 women.
    - For the 636 individuals with wages in all four quarters of 2003, the ratio of female to male earnings was 0.74. On average, for every dollar earned by a male worker, a female worker earned 74 cents, which is consistent with findings from other studies.
- As would be expected, individuals earning a degree from UMaine had higher quarterly wages than those who did not earn a degree from UMaine.
    - Among individuals earning a degree, males with a Bachelor's degree had the highest average quarterly wage.
    - For female workers, the highest average quarterly wage was for those earning a Master's degree.
    - Those studying in the engineering field realized the highest average quarterly wage.
- Those individuals employed for all four quarters of 2003 had higher quarterly wages than those individuals employed for fewer than four quarters.
    - Men had higher average quarterly wages than women, although women were slightly more likely than men to be employed all four quarters.

This study suggests the existence of a gap in wages between men and women. Further research is needed to identify the reasons behind this gap which may include but are not limited to part-time versus full-time work and individuals taking time, whether voluntarily or involuntarily, out of the labor force.

It is important to keep in mind that Maine covered employment wage record data do not distinguish between part-time and full-time workers, a fact that might contribute in great part to the earnings gap. Another limiting factor to the data is that they contain wages from Maine employers only. This latter limitation might manifest itself not only in cohort members for whom no Maine wage data exist but also in any cohort members with multiple seasonal jobs for which only a portion of the wages fall under Maine covered employment.

Recommendations

Based upon this initial research, a more extensive analysis is needed. There are two principal directions in which this study can be expanded: either further collection of employment data for the current cohort or inclusion of additional cohorts. Both expansions may be pursued simultaneously.

- Additional cohorts might be from:
  - other classes at UMaine or
  - another institution.

- Additional employment data for the current cohort might come from:
  - addition of further years of wage data in Maine or
  - inclusion of wage record data from other sources (currently efforts are underway to construct an agreement by which wage record data can be shared among states for research purposes)

Further time series analysis of the current or future cohorts would enable study of mobility in the workforce. Wage records from future periods will reveal movement of individuals in response to labor market conditions.

- Wage mobility examines changes in earnings over time. This movement in earnings might occur either by change in compensation level at a current job or through migration to a different employer, geographic location or industry sector.

- Geographic mobility examines strength of attachment to particular locations in employment decisions. This addresses the issue of whether moving or commuting to another location for work provides individuals a wage premium over those workers remaining in the same location.

- Workforce mobility examines exit from or re-entry into the labor force. It can also provide insight on the frequency and duration of individuals' time out of the labor force.

- Industrial mobility examines employment migration among industrial sectors. Understanding industrial mobility will become progressively more pertinent as the composition of the economy increasingly shifts from manufacturing to service-based industries.

Expansion of this wage record study through any of the methods described above will provide a better understanding of prevailing trends in the labor market for participants in higher education. A more detailed picture of labor market conditions will enable education and public sector administrators to tailor their efforts accordingly.

Appendix

Definitions

Maine covered employment refers to those individuals with wages reported by employers covered by the Maine Employment Security Law. This law excludes a number of different groups of workers, such as the self-employed, federal employees, and individuals working in other states. Individuals may have earnings from sources outside the scope of Maine covered employment. If individuals have earnings from both covered employment and non-covered employment, their wage record earnings would be lower than their actual total earnings.

Average quarterly wages were weighted to include only those quarters in which an individual had wages. Average annual wages were calculated as four times the average quarterly wage. Any quarters with no wages were excluded from the averages.

Average annual wage is the average quarterly wage converted to an annual basis (multiplied by four). If an individual had fewer than four quarters of wages, their average annual wage may be inflated.

References

U.S. Census Bureau, Longitudinal Employer-Household Dynamics (LEHD) program, Local Employment Dynamics (LED), average of four quarters of 2003 for Maine workforce, ages 22 to 24.

Maine Employment Security Law, M.R.S.A., Title 26, Chapter 13.

Tables

Table I corresponds with Chart A.

Table I

Distribution of Gender by Field of Study for Individuals with Any Wages

	Female		Male		
	Number	Percent of Row	Number	Percent of Row	Total Number
Business & Administration	36	41.4	51	58.6	**87**
Education	71	66.4	36	33.6	**107**
Engineering	11	11.8	82	88.2	**93**
Liberal Arts	150	56.6	115	43.4	**265**
Natural Resources, Veterinary & Food Science	18	29.5	43	70.5	**61**
Nursing & Health	55	96.5	*	*	**57**
Science & Math	7	28.0	18	72.0	**25**
None	67	58.3	48	41.7	**115**
Total	**415**	**51.2**	**395**	**48.8**	**810**

*Data do not meet Federal or State disclosure criteria but are included in the Total row.

Table II corresponds with Chart C.

Table II

Average Quarterly Wages by Highest Degree Earned at UMaine for Individuals with Wages

	Average Quarterly Wage ($)	Number	Percent
Individuals with Any Wages			
Certificate	6,805.50	3	0.7
Associate	6,782.33	30	7.2
Bachelor's	8,553.64	341	82.2
Master's	8,157.92	41	9.9
Total	**7,428.06**	**415**	**100.0**
Individuals with Four Quarters of Wages			
Certificate	6,805.50	3	0.9
Associate	7,563.84	25	7.4
Bachelor's	9,055.55	276	81.7
Master's	8,516.01	34	10.0
Total	**7,975.20**	**338**	**100.0**
Individuals with Wages in Fewer Than Four Quarters			
Certificate	N/A	0	0.0
Associate	1,572.27	5	6.5
Bachelor's	4,705.72	65	84.4
Master's	4,911.27	7	9.1
Total	**3,877.27**	**77**	**100.0**

Table III corresponds with Chart E.

Table III

Average Quarterly Wages by Field of Study for Individuals with Wages

	Average Quarterly Wage ($)	Number	Percent
Individuals with Any Wages			
Business & Administration	8,321.24	87	10.8
Education	6,604.03	107	13.2
Engineering	11,862.10	93	11.5
Liberal Arts	6,369.24	265	32.7
Natural Resources, Veterinary & Food Science	7,807.12	61	7.5
Nursing & Health	8,033.56	57	7.0
Science & Math	6,689.41	25	3.1
None	5,942.58	115	14.2
Total	**7,428.06**	**810**	**100.0**
Individuals with Four Quarters of Wages			
Business & Administration	8,772.63	70	11.0
Education	7,094.94	82	12.9
Engineering	12,379.28	78	12.3
Liberal Arts	6,821.85	208	32.7
Natural Resources, Veterinary & Food Science	8,348.14	47	7.4
Nursing & Health	8,300.58	50	7.9
Science & Math	7,291.31	20	3.1
None	6,649.51	81	12.7
Total	**7,975.20**	**636**	**100.0**
Individuals with Wages in Fewer Than Four Quarters			
Business & Administration	5,238.54	17	9.8
Education	3,622.22	25	14.4
Engineering	5,885.74	15	8.6
Liberal Arts	3,579.83	57	32.8
Natural Resources, Veterinary & Food Science	4,526.13	14	8.0
Nursing & Health	4,473.40	7	4.0
Science & Math	2,311.91	5	2.9
None	3,006.12	34	19.5
Total	**3,877.27**	**174**	**100.0**

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